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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

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In the matter of	)	
	)	
Amendment of Part 90 of the	)	PR Docket No. 93-61
Commission's Rules to Adopt	)	
Regulations for Automatic	)	
Vehicle Monitoring System	)	

SECOND ERRATUM

Released: March 1, 1995

By the Chief, Wireless Telecommunications Bureau:

1. On February 6, 1995, the Commission released a Report and Order in PR Docket No. 93-61, FCC 95-41, amending Part 90 of the Commission's Rules to adopt permanent regulations for the Location and Monitoring Service. On February 17, 1995, the Wireless Telecommunications Bureau released an Erratum, DA 95-265, to correct errors in the text and the rules attached in Appendix A of that Report and Order. This Second Erratum makes additional non-substantive corrections to the rules in Appendix A (e.g., renumbering and reformatting paragraphs). These corrections bring the rules into conformance with Federal Register printing requirements.

2. The attached Appendix A completely replaces Appendix A of the Report and Order.

FEDERAL COMMUNICATIONS COMMISSION

Regina M. Keeney

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Chief, Wireless Telecommunications Bureau

Appendix A

Parts 2 and 90 of Chapter I of Title 47 of the Code of Federal Regulations are amended as follows:

PART 2 - FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

1. The authority citation for Part 2 continues to read as follows:

Authority: Sec. 4, 302, 303, and 307 of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154, 154(i), 302, 303, 303(r), and 307, unless otherwise noted.

2. Section 2.106 is amended by adding "Private Land Mobile (90)" to the FCC use designators in the entry for 902-928 MHz in the table and by revising footnotes US218 and US275 to read as follows:

§ 2.106 Table of Frequency Allocations

* * * * *

International table	United States table		FCC use designators	
* * *	Government	Non-Government	Rulepart(s)	Special-use frequencies
	* * * * *			
* * *	902-928 RADIOLOCATION	902-928	Private Land Mobile (90) Amateur (97)	915 ± 13 MHz Industrial, scientific, and medical frequency.
	707 US215 US218 US267 US275 G11 G59	707 US215 US218 US267 US275		
	* * * * *			

US218 The band 902-928 MHz is available for Location and Monitoring Service (LMS) systems subject to not causing harmful interference to the operation of all Government stations authorized in these bands. These systems must tolerate interference from the

operation of industrial, scientific, and medical (ISM) devices and the operation of Government stations authorized in these bands.

* * * * *

US275 The band 902-928 MHz is allocated on a secondary basis to the amateur service subject to not causing harmful interference to the operations of Government stations authorized in this band or to Location and Monitoring Service (LMS) systems. Stations in the Amateur service must tolerate any interference from the operations of industrial, scientific, and medical (ISM) devices, LMS systems, and the operations of Government stations authorized in this band. Further, the Amateur Service is prohibited in those portions of Texas and New Mexico bounded on the south by latitude 31°41' North, on the east by longitude 104°11' West, and on the north by latitude 34°30' North, and on the west by longitude 107°30' West; in addition, outside this area but within 150 miles of these boundaries of White Sands Missile Range the service is restricted to a maximum transmitter peak envelope power output of 50 watts.

* * * * *

PART 90 - PRIVATE LAND MOBILE RADIO SERVICES

1. The authority citation for Part 90 continues to read as follows:

Authority: Secs. 4, 303, 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303, and 332, unless otherwise noted.

2. Section 90.7 is amended by removing the entry for Automatic Vehicle Monitoring and adding new definitions for Basic Trading Areas, Forward Links, Location and Monitoring Service (LMS), Major Trading Areas, Multilateration LMS System, and Non-multilateration LMS System in alphabetical order to read as follows:

§ 90.7 Definitions.

* * * * *

Basic Trading Areas. Service areas that are based on the Rand McNally 1992 Commercial Atlas & Marketing Guide, 123rd Edition, at pages 38-39, with the following additions licensed separately as BTA-like areas: American Samoa; Guam; Northern Mariana Islands; Mayaguez/Aguadilla-Ponce, Puerto Rico; San Juan, Puerto Rico; and the United States Virgin Islands. The Mayaguez/Aguadilla-Ponce BTA-like service area consists of the following municipios: Adjuntas, Aguada, Aguadilla, Anasco, Arroyo, Cabo Rojo, Coamo, Guanica, Guayama, Guayanilla, Hormigueros, Isabela, Jayuya, Juana Diaz, Lajas, Las Marias, Maricao, Maunabo, Mayaguez, Moca, Patillas, Penuelas, Ponce, Quebradillas, Rincon, Sabana

Grande, Salinas, San German, Santa Isabel, Villalba, and Yauco. The San Juan BTA-like service area consists of all other municipios in Puerto Rico.

* * * * *

Forward Links. Transmissions in the frequency bands specified in § 90.357(a) and used to control and interrogate the mobile units to be located by multilateration LMS systems.

* * * * *

Location and Monitoring Service (LMS). The use of non-voice signaling methods to locate or monitor mobile radio units. LMS systems may transmit and receive voice and non-voice status and instructional information related to such units.

* * * * *

Major Trading Areas. Service areas based on the Rand McNally 1992 Commercial Atlas & Marketing Guide, 123rd Edition, at pages 38-39, with the following exceptions and additions:

(a) Alaska is separated from the Seattle MTA and is licensed separately.

(b) Guam and the Northern Mariana Islands are licensed as a single MTA-like area.

(c) Puerto Rico and the United States Virgin Islands are licensed as a single MTA-like area.

(d) American Samoa is licensed as a single MTA-like area.

* * * * *

Multilateration LMS System. A system that is designed to locate vehicles or other objects by measuring the difference of time of arrival, or difference in phase, of signals transmitted from a unit to a number of fixed points or from a number of fixed points to the unit to be located.

* * * * *

Non-multilateration LMS System. A system that employs any of a number of non-multilateration technologies to transmit information to and/or from vehicular units.

* * * * *

3. Section 90.101 is revised to read as follows:

§ 90.101 Scope.

The Radiolocation Service accommodates the use of radio methods for determination of direction, distance, speed, or position for purposes other than navigation. Rules as to eligibility for licensing, permissible communications, frequency available, and any special requirements are set forth in the following section. Provisions for the Location and Montoring Service (LMS) are contained in Subpart M of this Part.

4. Section 90.103 is amended by removing paragraph (d) and by redesignating existing paragraph (e) as paragraph (d).

5. Section 90.155 is amended by revising paragraph (a) and adding new paragraphs (d) and (e) to read as follows:

§ 90.155 Time in which station must be placed in operation.

(a) All stations authorized under this part, except as provided in paragraphs (b) and (d) of this section and in §§ 90.629 and 90.631(f), must be placed in operation within eight (8) months from the date of grant or the authorization cancels automatically and must be returned to the Commission.

* * * * *

(d) Multilateration LMS systems authorized in accordance with § 90.353 must be constructed and placed in operation within twelve (12) months from the date of grant or the authorization cancels automatically and must be returned to the Commission. MTA-licensed multilateration LMS systems will be considered constructed and placed in operation if such systems construct a sufficient number of base stations that utilize multilateration technology (see paragraph (e) of this Section) to provide multilateration location service to a substantial portion of at least one BTA in the MTA.

(e) A multilateration LMS station will be considered constructed and placed in operation if it is built in accordance with its authorized parameters and is regularly interacting with one or more other stations to provide location service, using multilateration technology, to one or more mobile units. Specifically, LMS multilateration stations will only be considered constructed and placed in operation if they are part of a system that can interrogate a mobile, receive the response at 3 or more sites, compute the location from the time of arrival of the responses and transmit the location either back to the mobile or to a subscriber's fixed site.

6. Section 90.179 is amended by revising paragraph (g) to read as follows:

§ 90.179 Shared use of radio stations.

* * * * *

(g) Above 800 MHz, shared use on a for-profit private carrier basis is permitted only by SMR, Private Carrier Paging, and LMS licensees. See Subparts M, P, and S of this Part.

7. Section 90.203 is amended by adding new paragraph (b)(7) to read as follows:

§ 90.203 Type acceptance required.

* * * * *

(b) * * *

(7) Transmitters imported and marketed prior to April 1, 1996 for use by LMS systems.

* * * * *

8. Section 90.205(b) is amended by adding the 902-927.25 and 927.25-928 MHz bands to the table in numerical order and by adding footnote (13) to read as follows:

§ 90.205 Power.

* * * * *

(b) * * *

Frequency range (megahertz)	Maximum Output power (watts)	Maximum effective radiated power (watts)
* * * * *		
902-927.25	.....	30 ([13])
927.25-928	.....	300
* * * * *		

13 Effective radiated power shall be measured as peak envelope power.

* * * * *

9. Paragraph (g) of Section 90.207 is removed and reserved.

10. Section 90.209 is amended by adding new paragraphs (b)(10) and (m) to read as follows:

§ 90.209 Bandwidth limitations.

* * * * *

(b) * * *

(10) The maximum authorized bandwidth shall be 12 MHz for non-multilateration LMS operations in the band 909.75-921.75 MHz and 2 MHz in the band 902.00-904.00 MHz. The maximum authorized bandwidth for multilateration LMS operations shall be 5.75 MHz in the 904.00-909.75 MHz band; 2 MHz in the 919.75-921.75 MHz band; 5.75 MHz in the 921.75-927.25 MHz band and its associated 927.25-927.50 MHz narrowband forward link; and 8.00 MHz if the 919.75-921.75 MHz and 921.75-927.25 MHz bands and their associated 927.25-927.50 MHz and 927.50-927.75 MHz narrowband forward links are aggregated.

* * * * *

(m) For transmitters authorized under Subpart M that operate in the 902-928 MHz band, the peak power of any emission shall be attenuated below the power of the highest emission contained within the licensee's LMS sub-band in accordance with the following schedule:

(1) On any frequency within the authorized bandwidth: Zero dB.

(2) On any frequency outside the licensee's LMS sub-band edges (as identified in paragraph (m)(5) of this section): $55 + 10 \log(P)$ dB where (P) is the highest emission (watts) of the transmitter inside the licensee's LMS sub-band.

(3) The resolution bandwidth of the instrumentation used to measure the emission power shall be 100 kHz. If a video filter is used, its bandwidth shall not be less than the resolution bandwidth.

(4) Emission power (P) shall be measured in peak values.

(5) The LMS sub-band edges for multilateration systems for which emissions must be attenuated are 904.00, 909.75, 919.75, 921.75, 927.50, 927.75 and 928.00 MHz. If the 919.75-921.75 and 921.75-927.25 MHz sub-bands are aggregated by a single licensee, the emission mask limitations at the band edges at 921.75 and 927.50 MHz may be ignored. The LMS sub-band edges for non-multilateration systems for which emissions must be attenuated are 902.00, 904.00, 909.75 and 921.75 MHz.

11. Section 90.213 is amended by adding the 902-928 MHz band to the table in numerical order in paragraph (a) to read as follows:

§ 90.213 Frequency tolerance.

(a) * * *

	Frequency Tolerance			
Frequency range	Fixed and base stations		Mobile stations	
	Over 200W output power	200 w or less output power	Over 2W output power	2W or less output power
		* * * * *		
902-928	.00025	.00025	.00025	.00025
		* * * * *		

12. Section 90.239 is removed and reserved.

13. Subpart M is added to Part 90 to read as follows:

Subpart M -- Transportation Infrastructure Radio Service

§ 90.350 Scope.

The Transportation Infrastructure Radio Service is for the purpose of integrating radio-based technologies into the nation's transportation infrastructure and to develop and implement the nation's intelligent transportation systems. It includes the Location and Monitoring Service (LMS). Rules as to eligibility for licensing, frequencies available, and any special requirements for services in the Transportation Infrastructure Radio Service are set forth in this Subpart.

§ 90.351 Location and Monitoring Service.

These provisions authorize the licensing of systems in the Location and Monitoring Service (LMS). LMS systems utilize non-voice radio techniques to determine the location and status of mobile radio units. LMS licensees authorized to operate a system in the 902-928 MHz band may serve individuals, federal government agencies, and entities eligible for licensing in Part 90.

(a) Each application to license an LMS system shall include the following supplemental information:

(1) A detailed description of the manner in which the system will operate, including a map or diagram.

(2) The necessary or occupied bandwidth of emission, whichever is greater.

(3) The data transmission characteristics as follows:

(i) The vehicle location update rates;

(ii) Specific transmitter modulation techniques used;

(iii) For codes and timing scheme: A table of bit sequences and their alphanumeric or indicator equivalents, and a statement of bit rise time, bit transmission rates, bit duration, and interval between bits;

(iv) A statement of amplitude-versus-time of the interrogation and reply formats, and an example of a typical message transmission and any synchronizing pulses utilized.

(4) A plan to show the implementation schedule during the initial license term.

(b) LMS stations are exempted from the identification requirements of § 90.425; however, the Commission may impose automatic station identification requirements when determined to be necessary for monitoring and enforcement purposes.

§ 90.353 LMS operations in the 902 - 928 MHz band.

LMS systems may be authorized within the 902-928 MHz band, subject to the following conditions. LMS licensees are required to maintain whatever records are necessary to demonstrate compliance with these provisions and must make these records available to the Commission upon request:

(a) LMS operations will not cause interference to and must tolerate interference from industrial, scientific, and medical (ISM) devices and radiolocation Government stations that operate in the 902 - 928 MHz band.

(b) LMS systems are authorized to transmit status and instructional messages, either voice or non-voice, so long as they are related to the location or monitoring functions of the system.

(c) LMS systems may utilize store and forward interconnection, where either (1) transmissions from a vehicle or object being monitored are stored by the LMS provider for later transmission over the public switched network (PSN), or (2) transmissions received by the LMS provider from the PSN are stored for later transmission to the vehicle or object being monitored. Real-time interconnection between vehicles or objects being monitored and the PSN will only be permitted to enable emergency communications related to a vehicle or a passenger in a vehicle. Such real-time, interconnected communications may only be sent to or received from a system dispatch point or entities eligible in the Public Safety or Special Emergency Radio Services. See Subparts B and C of this Part.

(d) Multilateration LMS systems will be authorized on a primary basis within the bands 904-909.75 MHz and 921.75-927.25 MHz. Additionally, multilateration and non-multilateration systems will share the 919.75-921.75 MHz band on a co-equal basis. Licensing will be on the basis of Major Trading Area (MTA) service areas for multilateration systems, with one exclusive MTA license being issued for each of these three sub-bands. Except as provided in paragraph (f) of this Section, multilateration MTA licensees may be authorized to operate on only one of the three multilateration bands within a given MTA. Additionally, MTA multilateration LMS licenses will be conditioned upon the licensee's ability to demonstrate through actual field tests that their systems do not cause unacceptable levels of interference to Part 15 devices.

(e) Multilateration MTA-licensed systems and grandfathered AVM systems (see Section 90.363) are authorized on a shared basis and must cooperate in the selection and use of frequencies in accordance with Section 90.173(b).

(f) Multilateration MTA licensees may be authorized to operate on both the 919.75-921.75 MHz and 921.75-927.25 MHz bands within a given MTA (see Section 90.209(b)(10)).

(g) Multilateration LMS systems whose primary operations involve the provision of vehicle location services, may provide non-vehicular location services.

(h) Non-multilateration stations are authorized to operate on a shared, non-exclusive basis in the 902-904 MHz and 909.75-921.75 MHz sub-bands. Non-multilateration systems and multilateration systems will share the 919.75-921.75 MHz band on a co-equal basis. Non-multilateration LMS systems may not provide non-vehicular location services. The maximum antenna height above ground for non-multilateration LMS systems is 15 meters.

§ 90.355 LMS operations below 512 MHz.

Applicants requiring not more than 25 kHz bandwidth per frequency in the 25-50 MHz, 150-170 MHz, and 450-512 MHz bands may use either base-mobile frequencies currently assigned the applicant, or be assigned base-mobile frequencies available in the service in which eligibility has been established, provided that:

(a) For transmission between vehicles and base stations, each frequency in a single-frequency mode of operation will provide location data for approximately 200 vehicles, or both frequencies in a two-frequency mode of operation will provide location data for approximately 400 vehicles, except that for frequencies in the 450-512 MHz band that are assigned in pairs in accordance with the allocation plan for the band, the requirement is that location data be provided for approximately 200 vehicles for each frequency pair; and a showing is made that 50 percent of the vehicles will be in operation within the system by the end of the second year of the initial license term, and 70 percent will be in operation within the system by the end of the initial license term; except that if these vehicle loading standards will not be met, frequencies will be assigned only on a secondary non-interference basis to any authorized radiotelephony operation.

(b) The minimum separation between a proposed LMS station and the nearest co-channel base station of another licensee operating a voice system is 75 miles (120 km) for a single frequency mode of operation or 35 miles (56 km) for a two-frequency mode of operation. Where the minimum mileage separation cannot be achieved, agreement to the use of F1D, F2D, G1D, G2D or P0N emission must be received from all existing co-channel licensees using voice emissions within the applicable mileage limits. If there is interference with voice operations and required agreement was not received, or operation was authorized on a secondary non-interference basis, the licensee of the LMS system is responsible for eliminating the interference.

(c) Frequencies additional to any assigned under paragraph (a) of this section will not be assigned to the same licensee at any stations located within 64 km (40 miles) of any station in which the licensee holds an interest until each of such licensee's frequencies for LMS operation is shown to accommodate not less than 90 percent of the frequency loading requirements specified in paragraph (a) of this section.

§ 90.357 Frequencies for LMS systems in the 902 - 928 MHz band.

(a) Multilateration LMS systems will be authorized on the following LMS sub-bands:

LMS Sub-band	Forward Link([1])
904.000-909.750 MHz	927.750-928.000 MHz
919.750-921.750 MHz ([2])	927.500-927.750 MHz
921.750-927.250 MHz	927.250-927.500 MHz

1 Forward links for LMS systems may also be contained within the LMS sub-band. However, the maximum alllowable power in these sub-bands is 30 watts ERP in accordance with Section 90.205(b).

2 The frequency band 919.750-921.750 MHz is shared co-equally between multilateration and non-multilateration LMS systems.

(b) Non-multilateration LMS systems will be authorized on the following frequency bands:

LMS Sub-band [1]
902.000-904.000 MHz
909.750-921.750 MHz

1 Applicants for non-multilateration LMS systems should request only the minimum amount of bandwidth necessary to meet their operational needs.

§ 90.359 Field strength limits for MTA-licensed LMS systems.

MTA-licensed multilateration systems shall limit the field strength of signals transmitted from their base stations to 47 dBuV/m at their MTA boundary.

§ 90.361 Interference from Part 15 and Amateur operations.

Operations authorized under Parts 15 and 97 of this Chapter may not cause harmful interference to LMS systems in the 902-928 MHz band. These operations will not be considered to be causing harmful interference to a multilateration LMS system operating in one of the three MTA sub-bands (see Section 90.357(a)) if they operate in accordance with the provisions of 47 CFR Parts 15 or 97 and at least one of the following conditions are met:

(a) It is a field disturbance sensor operating under Section 15.245 of this Chapter and it is not operating in the 904-909.750 or 919.750-928.000 MHz sub-bands; or

(b) It does not employ an outdoor antenna; or

(c) If it does employ an outdoor antenna, then if

(1) The directional gain of the antenna does not exceed 6 dBi, or if the directional gain of the antenna exceeds 6 dBi, it reduces its transmitter output power below 1 watt by the proportional amount that the directional gain of the antenna exceeds 6 dBi; and

(2) Either

(i) The antenna is 5 meters or less in height above ground; or

(ii) The antenna is more than 5 meters in height above ground but less than or equal to 15 meters in height above ground and either:

(A) Adjusts its transmitter output power below 1 watt by 20 log (h/5) dB, where h is the height above ground of the antenna in meters; or

(B) Is providing the final link for communications of entities eligible under Subparts B or C of Part 90.

§ 90.363 Grandfathering provisions for existing AVM Licensees.

(a) These provisions authorize grandfathered operation by automatic vehicle monitoring (AVM) systems licensed on or before February 3, 1995. To attain grandfathered status for their stations, existing multilateration AVM licensees must file, on or before **[insert date 60 days after publication in the Federal Register]**, applications to modify their station licenses to comply with the band plan shown in Section 90.357(a). These applications to modify must identify the multilateration sub-band or sub-bands in which the applicants intend to operate their LMS system stations, once their applications to modify have been authorized. The application to modify a license to comply with the band plan shown in Section 90.357(a) may also include a modification to specify an alternate site, so long as the alternate site is 2 kilometers or less from the site specified in the original license.

(b) When existing multilateration AVM licensees file applications to modify, as specified in paragraph (a), they must certify that either:

(1) The stations that compose their AVM system were constructed and placed in operation in accordance with Section 90.155(e) on or before February 3, 1995 or

(2) The stations were not constructed and placed in operation in accordance with Section 90.155(e) on or before February 3, 1995.

(c) Multilateration AVM systems that were constructed and placed in operation on or before February 3, 1995 will be given until April 1, 1998 to convert to the spectrum identified in their LMS system license. Such licensees may continue to operate their systems during this period. Licensees of multilateration AVM constructed and operational systems that do not file applications to modify on or before **[insert date 60 days after publication in the Federal Register]**, will be permitted to continue operations under the provisions of former Section 90.239 until April 1, 1998 or the end of their original license term, whichever occurs first, at which time such licenses will cancel automatically and will not be renewed.

(d) Multilateration AVM licensees for stations that were not constructed and placed in operation on or before February 3, 1995 must construct their LMS systems and place them in operation on the spectrum identified in their LMS system license on or before April 1, 1996, or their licenses will cancel automatically (see Section 90.155(e)). Also, these licenses will cancel automatically on **[insert date 60 days after publication in the Federal Register]** unless timely modification applications are filed on or before this date (see paragraph (a)).

(e) Non-multilateration systems licensed in spectrum other than the 902.00-904.00 and 909.75-921.75 MHz bands must modify their licenses by April 1, 1998 to specify operation solely in the bands provided in Section 90.357(b) for non-multilateration systems and to operate their systems consistently with the provisions of Section 90.353.